

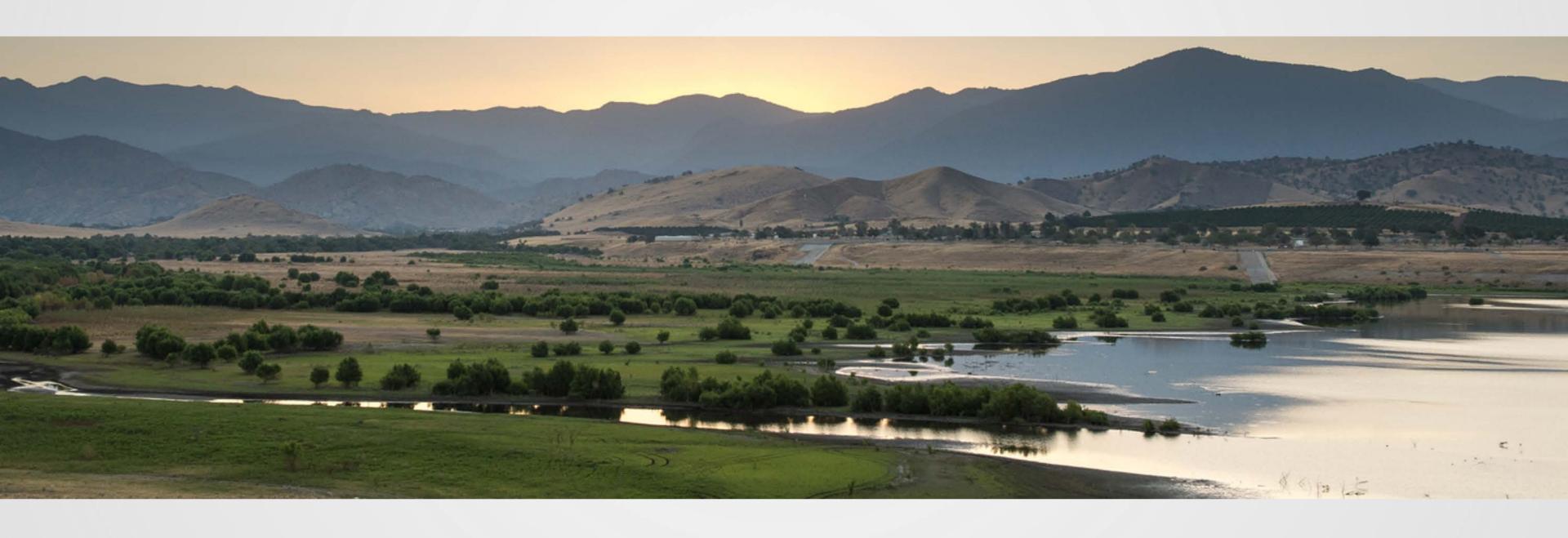
# FLOOD-MAR OVERVIEW AND PROGRAM ALIGNMENT

APRIL 21, 2021
CALIFORNIA WATER COMMISSION

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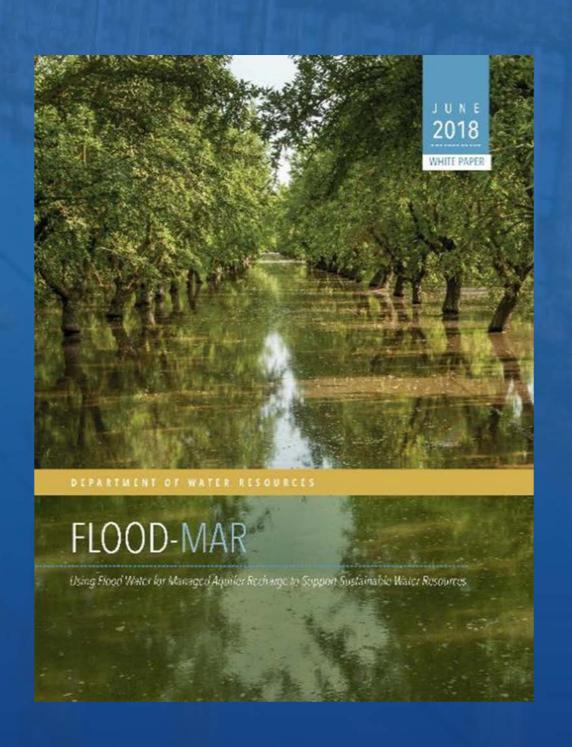
- Flood-MAR White Paper
- DWR's Flood-MAR Program Overview
  - Watershed Studies
  - Pilot Projects
  - Guidance and Outreach
- Flood-MAR Alignment Activities
- Flood-MAR and Conveyance Needs

## Flood-MAR White Paper



## Flood-MAR White Paper

Flood-MAR's potential and value for California is achieved by integrating Flood-MAR with other regional recharge efforts; changing management of California's water system to better integrate surface water and groundwater; upgrading conveyance, storage, and operations; and considering Flood-MAR's opportunities as related to water transport and transfers are some of the system integration considerations.



# Considerations for Implementing Flood-MAR Projects

#### Governance and Coordination: How will project needs be coordinated?

- Landowner willingness
- Local or system needs and opportunities
- Partnerships and agreements
- Coordination and operations decisions
- Legal/ regulatory framework

#### Funding and Incentives: How will project be funded and landowners compensated?

- Available funding sources
- Landowner incentive or compensation programs
- Recharge quantification

#### Source Water: Where will the surface water come from?

- High flows
- Reservoir reoperation
- Timing and quantity of flows
- How are flows expected to change in the future?

#### Conveyance: How will surface water get to the site?

- Existing infrastructure
- New infrastructure

#### Site Suitability: Where are good candidate sites for recharge?

- Soil suitability
- Crop suitability
- Aquifer suitability
- Aquifer capacity
- Aquifer water quality
- Vadose zone water quality

#### Recharge Method: How will the water get into the ground?

- On-farm
- Fallowed land
- Dedicated basin
- In-lieu
- Direct injection

## Groundwater Use: How will groundwater be recovered or otherwise used?

- Groundwater extraction wells
- Beneficial Uses
- Augmentation of groundwater for replenishment/ restoration

#### Feasibility Analysis: Is the project feasible?

- Benefits and beneficiaries
- Costs and impacts
- Agreements and assurances

### Potential Public Benefits of Flood-MAR

- Flood risk reduction
- Drought preparedness
- Aquifer replenishment
- Ecosystem enhancement
- Groundwater remediation/water quality
- Working lands preservation & stewardship
- Climate change adaptation
- Recreation and aesthetics

## DWR Flood-MAR Program



### DWR's Flood-MAR Program



Guidance and Outreach

**Guidance Informed by Pilot Results** 

**Locals Use Guidance to Setup Pilots** 

Pilot Projects & Studies

# DWR's Flood-MAR Program Activities

#### Watershed Studies

- Merced Study
- Tuolumne Study

#### **Guidance and**

#### Outreach

- White Paper
- Research Priorities
  - Tech Memos
    - Network

### Pilot Projects & Studies

- GSA/District
  - Parcel

## Merced Study Purpose & Goals

- Watershed scale analysis
- Integrated toolset
- Climate change vulnerability and adaptation
- Guidance for studies in other areas



### Conveyance Considerations

- Low hanging fruit just moving floodwaters to unlined distribution systems
  - Flood risk reduction and recharge benefits at district scale
- Conveyance availability (time of year, maintenance)
- Conveyance capacity for multiple benefits

# DWR's Flood-MAR Program Activities

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## TNC Multi-Benefit Recharge

 Evaluate and demonstrate managed aquifer recharge opportunities that deliver:





+ flood risk reduction







# Site Selection – Conveyance Constraints

- Screening criteria Distance to existing surface water conveyance
- Interesting conveyance dynamic in San Joaquin
  - Summer/fall window may be better for west side of valley using water deliveries in canals
  - Winter/spring window may be better for east side of valley using high flows in natural channels and bypasses



## Scoping Other Pilots

- On-farm demonstrations projects in Sacramento and San Joaquin valleys
- Floodplain recharge analysis and demonstration project along the San Joaquin River
- District-scale implementation in the San Joaquin Valley

# DWR's Flood-MAR Program Activities

#### **Watershed Studies**

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- Tuolumne Study

#### **Guidance and**

#### Outreach

- Research Priorities
  - Tech Memos
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### Pilot Projects & Studies

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### Outreach Activities

- 2017 and 2019 Public Forums
- 2019 Ag Community Listening Session
- 2019 Research Advisory Committee
- 2020/2021 Monthly Lunch-MAR Webinars
- 2020/2021 Flood-MAR Network Convening

### Feedback Related to Conveyance

- In many areas of the state, lack of sufficient conveyance facilities is a constraint.
  - Many critically overdrafted basins do not have sufficient infrastructure for managed aquifer recharge.
- Capacity constraints can limit the conveyance of water to a groundwater recharge location.
- New or modified conveyance facilities, and modified operation of existing facilities, are required to maximize managed aquifer recharge statewide.
  - The maintenance and restoration of existing, and construction of new, infrastructure that can facilitate Flood-MAR needs to be evaluated.

## Flood-MAR Alignment



- Water Resilience Portfolio Actions
- Central Valley Flood Protection Plan
- CVFPP Conservation Strategy
- Forecast-Informed Reservoir Operations
- Sustainable Groundwater Management Act Implementation

#### Water Resilience Portfolio Actions

- 3.4 ...provide technical assistance to facilitate [Flood-MAR]...
- 11.3 Support expansion of multi-benefit floodplain projects...
- 19.3 Conduct a feasibility analysis for improved and expanded [conveyance] capacity...
- 22.5 Assess and integrate...surface and groundwater models.
- 25.4 Update and refine the [San Joaquin River] regional flood management strategy...
- 27.1 Support...watershed-scale climate vulnerability and adaptation assessments...to address risks to water supply, ecosystems, and water quality.
- 27.3 ...evaluate...forecast-informed reservoir operations...to improve flood control and surface and ground water supply storage.

- Central Valley Flood Protection Plan
  - Looking at opportunities to better coordinate flood and groundwater management
  - Many flood channels (rivers and bypasses) do not meet flood design capacity
    - Due to vegetation, sedimentation, or subsidence
  - Opportunities to evaluate conveyance for habitat floodplain restoration and ecosystem benefits in flood bypasses



## Flood-MAR Alignment with other

State Efforts

Figure 2-4a. Representative Photograph of Remna Sacramento River (at River Mile 71)

Figure 2-4b. Representative Photograph of Riparian Habitat and

Source: 2016 Conservation

CVFPP Conservation Strategy

 Sharing tools to evaluate floodplain recharge potential

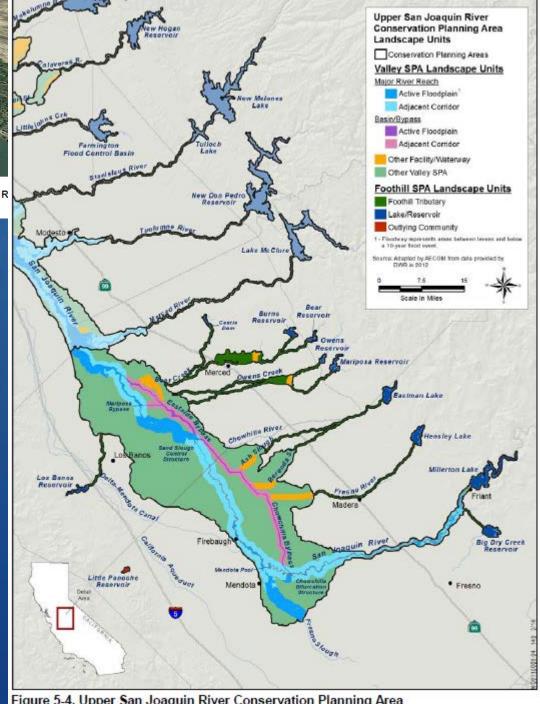
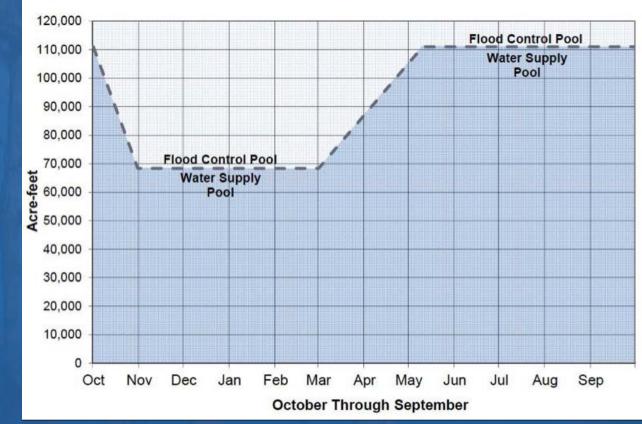


Figure 5-4. Upper San Joaquin River Conservation Planning Area



Source: Center for Western Weather and Water Extremes

- Forecast-Informed Reservoir Operations
  - Evaluating recharge pool concepts and FIRO scenarios to better coordinate surface and groundwater management

## Flood-MAR Alignment with other

State Efforts



Source: The Nature Conservancy Multi-Benefit Recharge Program

- Sustainable Groundwater Management Act Implementation
  - Coordinate pilot projects aquifer characterization needs

## Conveyance Needs



# Summary of Conveyance Issues Related to Flood-MAR Activities

- Many potential recharge areas are not connected to surface supplies
- Many channels do not meet design capacity and have inadequate capacity for multiple benefits
- Coordination with canal maintenance
- Partnerships (joint use/multiple benefits)

## One final plug...

- Join the Flood-MAR Network!
  - Jennifer.Marr@water.ca.gov



## Thank you!

